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REMARKS

On August 30, 2000, the Applicants filed an Information Disclosure Statement (IDS). A copy of the Form PTO-1449 was returned by the Examiner with the subsequent Office Action. However, none of the references listed thereon have been initialed. Accordingly, it is requested that the Examiner initial and return a copy of the attached duplicate Form PTO-1449 to indicate that the documents have been considered.

The Applicants request reconsideration of the rejection.

Claims 3-4 and 11-16 are now pending.

Claims 3-4 and 11-12 were rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 885 648 (EP '648) in view of either JP 11-216455 (JP '455) or Lang, et al, U.S. Patent No. 6,235,256 (Lang). Claims 3-4 and 11-12 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno, et al, U.S. Publication No. 2001/0001652 (Kanno) in view of either JP '455 or Lang (Kanno is a U.S. Published application claiming foreign priority benefits to the same Japanese priority application claimed by EP '648).

The present claims are directed to a method of treating perfluorocompound (PFC) gas which, in exemplary embodiments disclosed in the present specification, results from the etching of semiconductors, cleaning of semiconductors, etc.

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As set forth in claim 3, the method includes steps of decomposing the PFC gas, in which at least one of SF_6 and NF_3 are present, by any of the methods set forth in the claim, washing the gas generated by the decomposition by contacting the gas with at least one of water and an aqueous alkaline solution, and exhausting the washed gas. Between the washing and exhausting steps, the method includes a further step of removing, from the washed gas, at least one of SO_x and NO_x accompanying water, which are decomposition products of the SF_6 and/or NF_3 decomposed in the decomposing step. Claim 4 contains similar language.

Claim 11 recites a method of treating PFC gas, including the steps of decomposing the PFC gas which contains at least one of SF_6 and NF_3 ; washing the decomposed gas, which contains PFC decomposition products including HF and at least one of SO_x and NO_x generated by the decomposition, by making the decomposed gas contact at least one of water and an aqueous solution to make the PFC decomposition products be absorbed therein; and exhausting the waste gas resulting from the washing, wherein a step of removing PFC decomposition products accompanied with a mist is performed between the washing and the exhausting steps.

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Against these claims, the Examiner cites EP '648, or in the alternative, Kanno, as disclosing the base steps of decomposing, washing, and exhausting. Thus, EP '648 or Kanno represent the prior art improved by the present invention. In this regard, the Applicants note that the Examiner states that neither EP '648 nor Kanno discloses steps of removing SO_x or NO_x from the decomposed gas after washing (Office Action at page 3, lines 5-6 and page 4, lines 12-13).

As secondary references allegedly combinable with either EP '648 or Kanno, the Examiner cites, again in the alternative, either JP '455 or Lang. Neither secondary reference, however, discloses or fairly suggests the improvement of removing at least one of SO_x and NO_x accompanying water or mist, as decomposition products of the PFC decomposition step.

JP '455 discloses a treating apparatus including a catalytic thermal decomposition device for preventing degeneration of harmful exhaust gases. Contrary to the Examiner's statement that JP '455 discloses a process for treating an exhaust gas generated in a process of making a printed circuit board, JP '455 actually discloses a treating apparatus for removing harmful exhaust products during the treatment of discarded printed circuit boards. This waste gas

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includes hydrogen bromide, carbon dioxide, and steam, which is washed with an aqueous solution of NaOH and dehydrated by a cyclone to be dried for emission of the remaining gases. Thus, JP '455 does not disclose the decomposition of a PFC gas resulting in the decomposition of at least one of SF_6 and NF_3 , which are subsequently washed by contact with at least one of water and an aqueous alkaline solution, as required by the claims.

Furthermore, the dehydration by cyclone 8 in JP '455 is to remove moisture only. JP '455 does not disclose or suggest that the washed waste gas contains SO_x or NO_x . In fact, JP '455 does not disclose that the washed waste gas contains products of hydrogen bromide or carbon dioxide subject to the washing step.

Therefore, the person of ordinary skill in the art is not taught to apply the cyclone of JP '455 to remove decomposition products resulting from the process of EP '648 or Kanno. Absent such a motivation to combine the teachings of JP '455 with those of the base references, there can be no prima facie case of obviousness of the presently claimed invention.

Furthermore, neither EP '648/Kanno nor JP '455 recognizes that the decomposition-treatment of the PFC gas and subsequent washing leaves water-borne or mist-borne products of

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decomposition, including SO_x and/or NO_x , which can be emitted into the atmosphere. Fundamentally, therefore, one cannot say that the present invention, which solves this heretofore unrecognized problem with the prior art, is obvious.

Similarly, the secondary reference to Lang does not teach the advancement of the present invention. In Lang, a process and device for scrubbing acidic gases is disclosed. More particularly, flue gases are conveyed into the first stage of a scrubber in a direction opposite to the flow of suspension droplets in the first stage, and then into a second stage in the same direction as the flow of droplets. However, Lang neither discloses nor suggests that the flue gas is decomposed into at least one of SF_6 and NF_3 , or subjected to a removal step for removing at least one of SO_x and NO_x accompanying water resulting from decomposition of the SF_6 and/or NF_3 , following a washing step and before exhausting. Therefore, the person of ordinary skill learns, from Lang, a process for treating a different type of gas having different requirements and different problems than those of either EP '648 or Kanno, such that there is no legal motivation for combining Lang's teachings with those of the base references. In addition, there is no teaching in either of the base references or in Lang of any recognition of the prior art problem outlined

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above, or a solution to it. Therefore, the person of ordinary skill is not led to the presently claimed invention by the combination of EP '648/Kanno with Lang.

The above remarks have particular relevance to the limitations set forth in independent claims 3 and 4. Independent claim 11 recites the removal step in terms of removing mist in the waste gas for removing the PFC decomposition products accompanied with the mist. Because each of the four references applied against the claim fails to recognize the solution of removing decomposition product-laden mist after washing a PFC-decomposed gas, claim 11 patentably defines over the prior art for the same reasons advanced above.

New claim 13 is directed to a method of treating PFC gas including sequential steps of decomposing at least one of SF_6 and NF_3 present in the PFC gas, washing the gas generated in the decomposition with water, removing mist from the water-washed gas by a cyclone, and exhausting the gas of the mist-removed gas outside the treating system. Thus, for the same reasons advanced above, claim 13 patentably defines over the prior art.

New claims 14-16 are directed to further limiting details of the method set forth in claim 13, and thus inherit its


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patentability. Further, the prior art of record fails to suggest the limitations of claims 14-16 in combination with the limitations of claim 13.

In view of the foregoing amendments and remarks, the Applicants request reconsideration of the rejection and allowance of the claims.

Respectfully submitted,


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FORM PTO-1449 (REV. 7-80)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. NIP-198		SERIAL NO. 09/651,783	
LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)				APPLICANT S. KANNO et al		GROUP	
				FILING DATE August 30, 2000			
U.S. PATENT DOCUMENTS							
* EXAMINER INITIAL		DOCUMENT	DATE	NAME	CLASS	SUBCLASS	FILING DATE (If Appropriate)
	AA						
	AB						
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						
	AK						
FOREIGN PATENT DOCUMENTS							
		DOCUMENT	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO
	AL	11-70322	03/16/99	Japan			<input type="checkbox"/> <input type="checkbox"/>
	AM	11-216455	08/10/99	Japan			<input type="checkbox"/> <input type="checkbox"/>
	AN	57-197023	12/03/82	Japan			<input type="checkbox"/> <input type="checkbox"/>
	AO	8-318122	12/03/96	Japan			<input type="checkbox"/> <input type="checkbox"/>
	AP						<input type="checkbox"/> <input type="checkbox"/>
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)							
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* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 608; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							